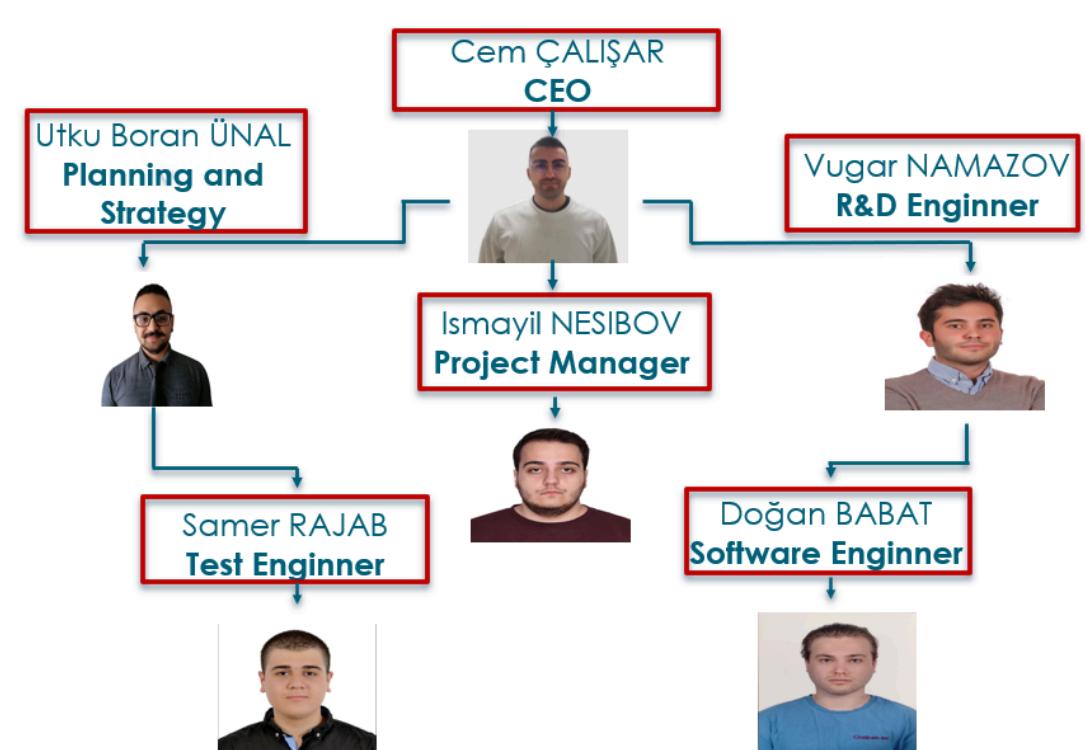
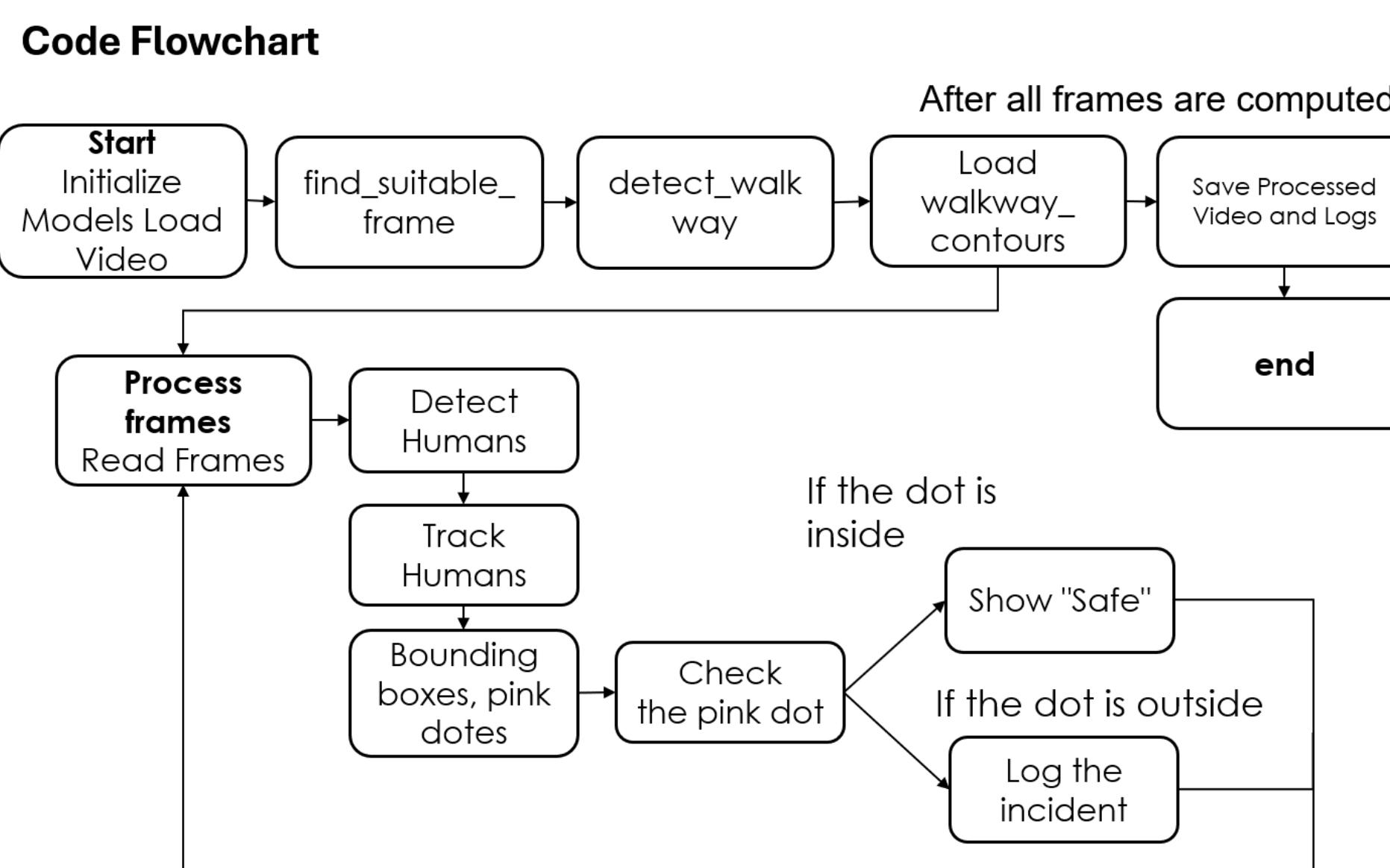


**Shareholders:** Doğan Babat, Cem Çalışar, Vugar Namazov, Ismayil Nesibov, Utku Boran Ünal, Samer Rajab  
**Supervisor:** Prof. Dr. Behçet Murat Eyüboğlu

### Team Organization



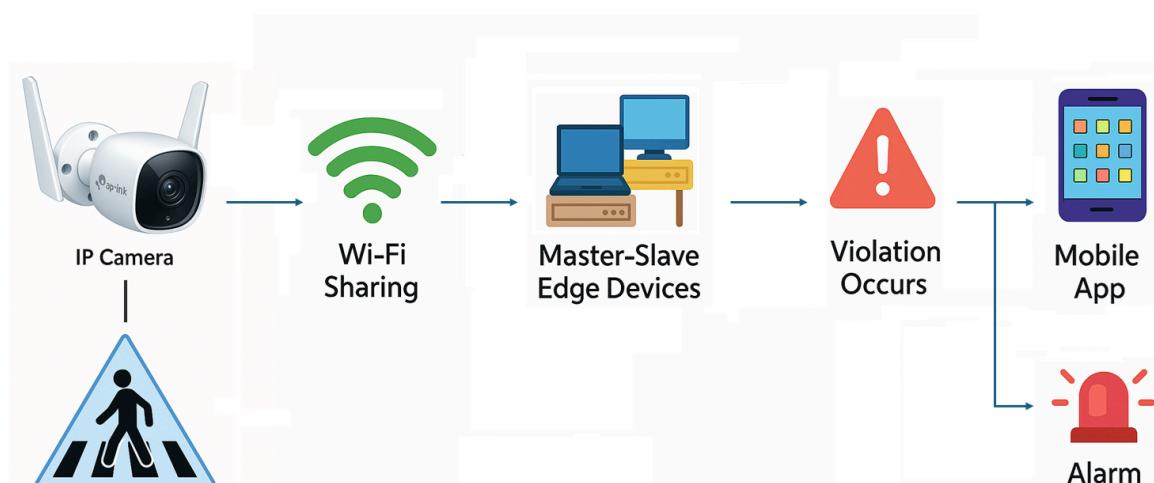
### Solution Approach



### Project Description

Negligence of walkway boundaries in busy industrial environments is a common cause of safety incidents. This system replaces manual monitoring with automated violation detection and real-time alerts. It is cost-effective, easy to install, and provides instant incident logs and notifications through a mobile app.

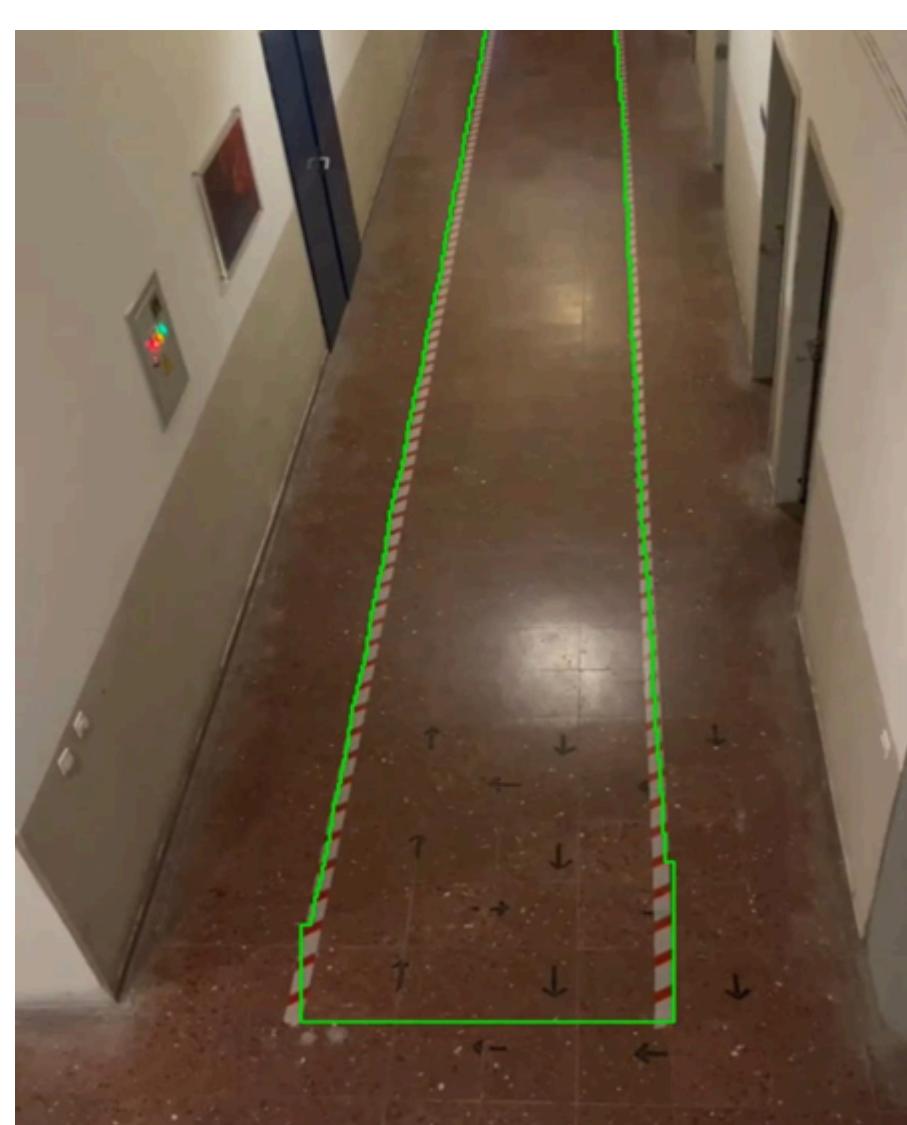
### System Design



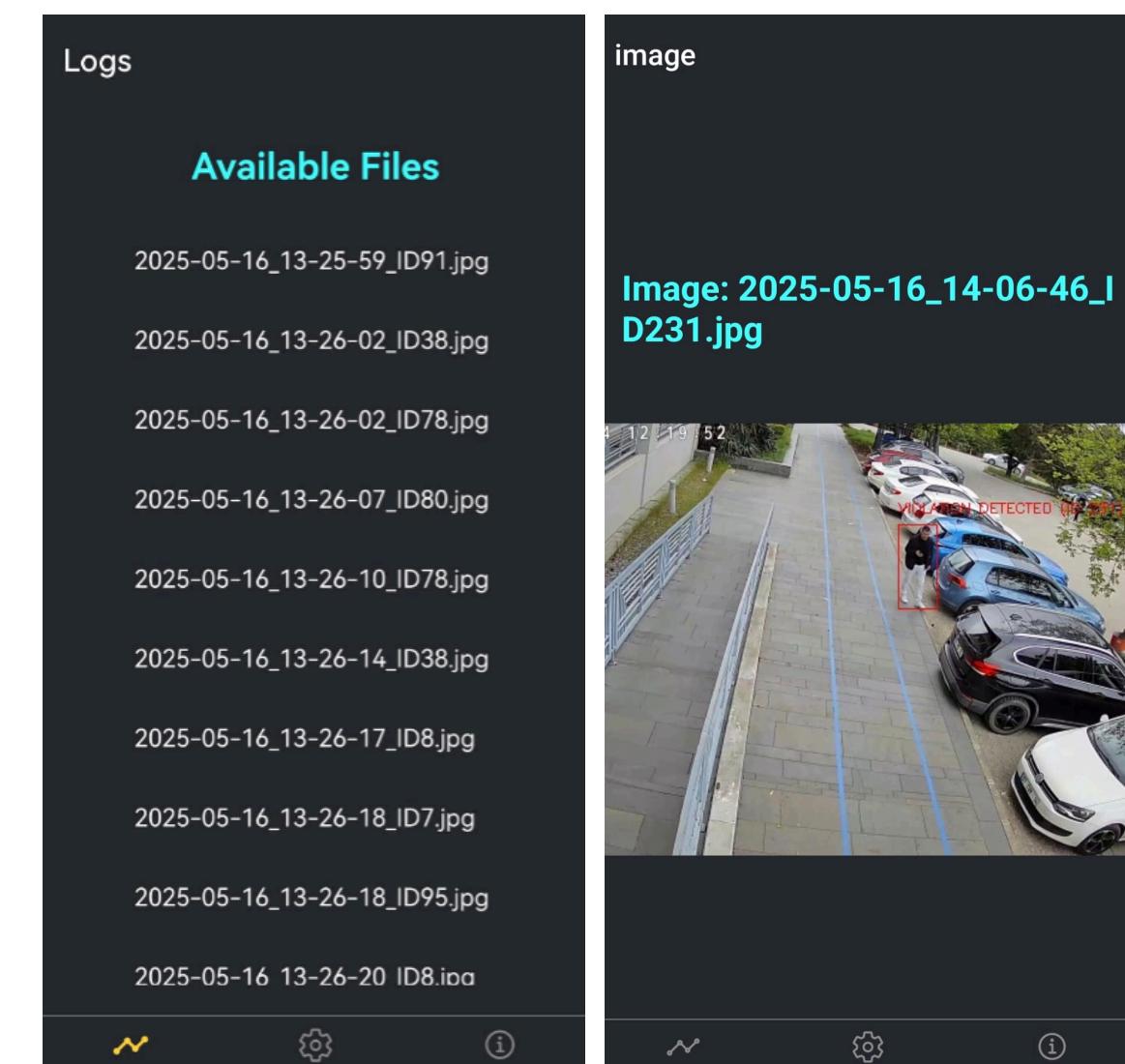
IP cameras stream to edge devices in a master-slave setup. YOLOv8 detects people; DeepSORT tracks them across frames. Violations trigger logging, an audible alarm, and a mobile alert. The system adapts to various walkway layouts and syncs data across devices.



Outdoor walkway contour

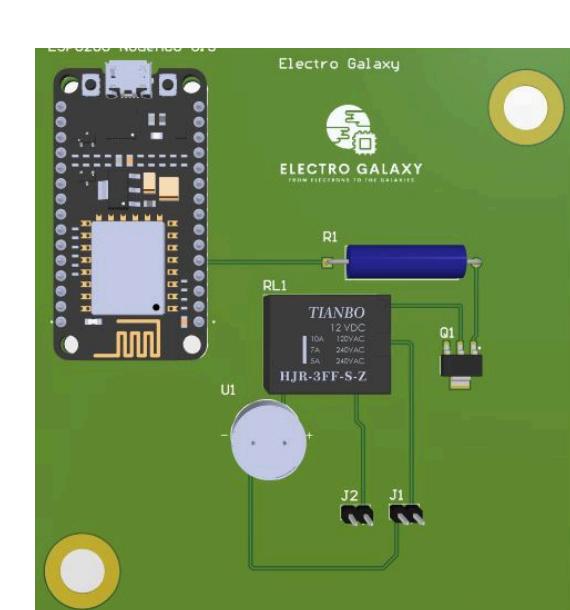


Indoor walkway contour



### Deliverables

- IP Cameras (3x TP-Link Tapo C310)
- Master and Slave Edge Devices
- Mobile Application (Android)
- Audible Alarm Module ( $\geq 80$  dB)
- Detection & Tracking Software (YOLOv8 and DeepSORT)
- Tapes for walkway marking
- User Manual



Alarm Module



IP Camera Setup

### Cost Breakdown

Category	Items	Cost
Hardware	TP-Link Tapo C310 (3 units)	100.21\$
	TP-Link LS1005G Ethernet Switch and 5 Cat6 Ethernet Cables	23.79 \$
	ESP8266, MP3 Player, Speaker and TPA3116D2 Amplifier	26\$
	Mounting brackets and measuring tools	10 \$
Software	Amazon Web Services	5 \$
Total		165\$

### Test performance

Test Name	Measured
Image Delay	< 1 sec (indoor) < 2.5 sec (outdoor)
Processing Latency	< 4 sec (indoor) < 5 sec (outdoor)
Walkway Detection	> 96 % TPR (indoor) > 98 % TPR (outdoor)
Violation Accuracy	> 83.3% (indoor) > 85% (outdoor)
Notification Delay	< 3 sec

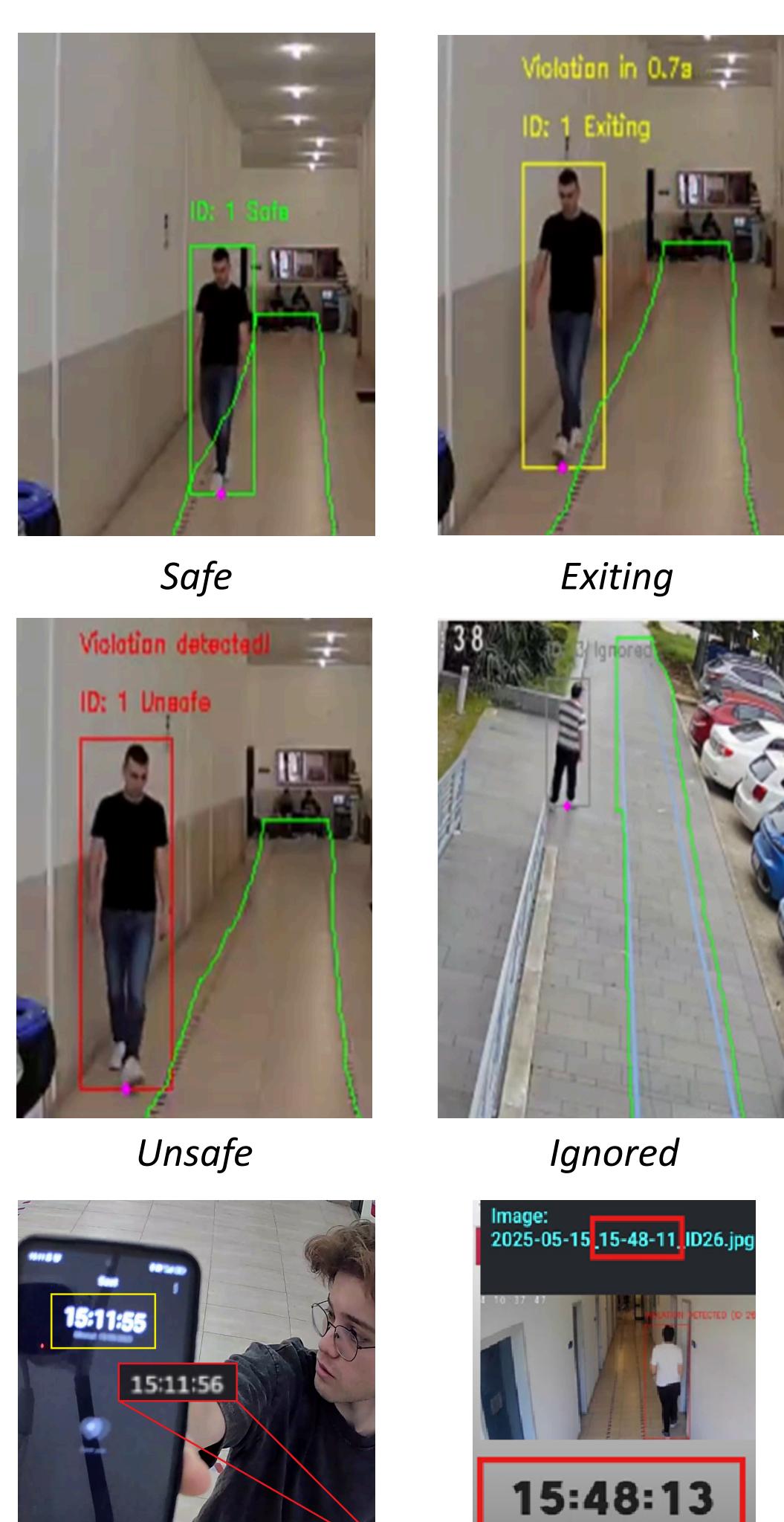


Image Delay

Notification Delay